

ProChem inc.

47 Ag [Kr]5s ¹ 4d ¹⁰ silver 107.9	48 Cd [Kr]5s ² 4d ¹⁰ cadmium 112.4	49 In [Kr]5s ² 4d ¹⁰ 5p ¹ indium 114.8	50 Sn [Kr]5s ² 4d ¹⁰ 5p ² tin 118.7	51 Sb [Kr]5s ² 4d ¹⁰ 5p ³ antimony 121.8
80 Hg [Xe]4f ¹⁴ 5d ¹⁰ 6s ² mercury 200.6	81 Tl [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ¹ thallium 204.4	82 Pb [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ² lead 207.2	83 Bi [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ³ bismuth 208.98	84 Po [Xe]4f ¹⁴ 5d ¹⁰ 6s ² 6p ⁴ polonium [209]



Your Source of High Purity Materials

*CELEBRATING 38 YEARS
IN BUSINESS!*

Vision Statement

*To be the leading **US provider** of high purity inorganic compounds and custom precursors for Advanced Materials applications.*

Mission Statement

To provide a stable long-term source for Critical Chemicals, ensuring that supply chains are robust, and purity standards are maintained. We pride ourselves on our customers' satisfaction as we provide innovative solutions to their unique needs.

Product Lines and Services

- High Purity Inorganics & Metal Organics
- Rare Earth Products & Pure Elements
- Precursors for Crystal Growth & Electronics
- Custom Formulations
- Custom Synthesis & Process Development
- Custom Packaging, Blending & Tolling



Founder and President – Reno Novak

- Bachelor of Science in Chemistry, Beloit College, WI
- Pierce / ThermoFisher, Rockford, IL
- Apache Chemicals / Olin Microelectronics, Seward, IL
- 1986 ProChem, Inc.
- 2012 Nova-Kem LLC (Wonik NA since 2018)
- 2016 ChemFree DeFoam LLC, Hudson, MA
- Member of SOCMA, ACS, MRS, AACG, ACER, ECS, and InfoMax



Historical Overview

1986 Founded ProChem to produce specialty inorganic chemicals

1988 - Present: Ultra High Purity Potassium Dihydrogen Phosphate (Lawrence Livermore National Laboratories)

1990 - Present: Critical Reagents for Diabetic Diagnostics (Bayer/Siemens Healthcare)

1992 - 1994: Precursors for Ferroelectric Research (Motorola)

1992 - 1995: Precursors for Antistatic / Antireflective CRT Screens Coatings (Clinton Electronics)

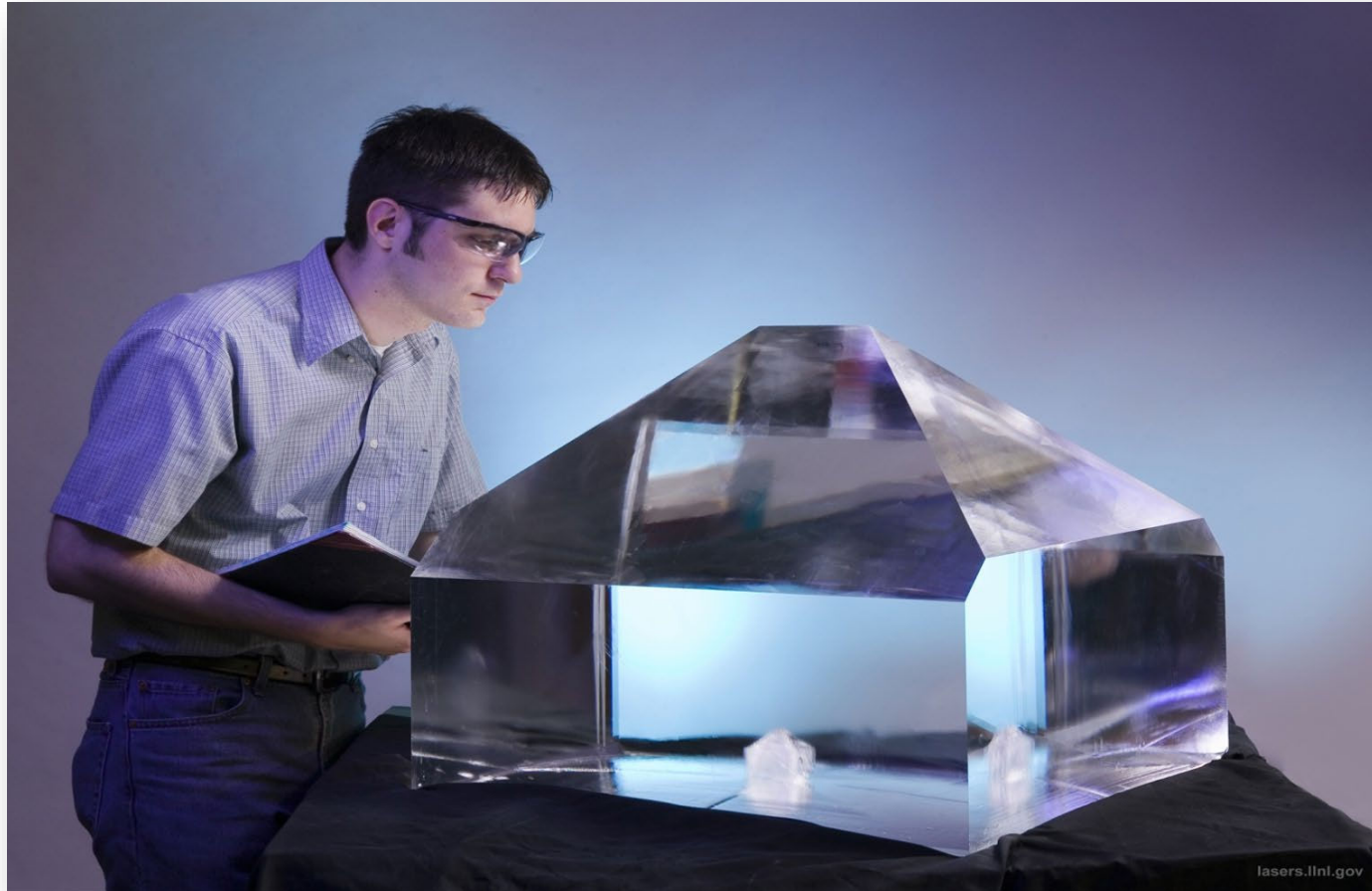


*Single Crystal
Potassium Dihydrogen Phosphate*



 Bayer HealthCare

Historical Overview



Finished KDP Crystal (450 kg)

Used at the National Ignition Facility (NIF) at Lawrence Livermore National Labs

On December 5th 2022, the NIF achieved fusion ignition by converting 2.05 megajoules of energy into 3.15 megajoules of fusion energy

Historical Overview

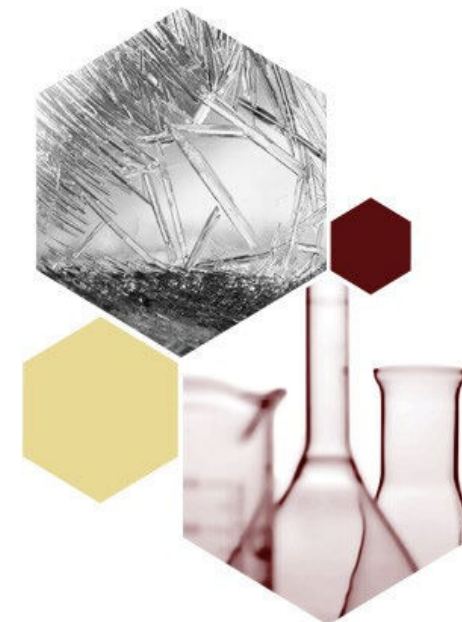
2003 - Present: Anhydrous Metal Bromides for Liquid Crystal Displays

2007 - Present: Chrome Free Corrosion Coatings for the Auto Industry

2008 - 2010: Developed process for making and purifying Hexachlorodisilane (Si_2Cl_6) for semiconductor memory chips. (Samsung) 10 Metric tons/year capacity

During 2011: Formed spin-off company **Nova-Kem** to develop precursors for semiconductor industry

2020 - Present: Anhydrous Rare Earth Chlorides at Scale



Neodymium Chloride Anhydrous

Applications

Essential component of the Remdesivir's production process

2020

April:	4 kg
May	4 kg
June	1150 kg
July	1350 kg
August	2000 kg
September	1500 kg
November	1000 kg



ANALYTICAL REPORT



Company : _____ P.O.# : _____
 Material : #2633 Neodymium chloride anhydrous, 99.9% Lot # : 11160
 Quantity : _____ Date : 8/31/2021

ANALYTICAL METHODS : Emission Spectroscopy
 Analysis : UV Spectroscopy _____
 IR Spectroscopy _____
 Parts per million Typical _____
 Parts per billion _____ Actual % Nd = 57.71%

Ag	ND	F	_____	Nb	_____	Sm	_____
Al	115.22	Fe	6.95	Nd	_____	Sn	ND
As	< 1	Ga	_____	Ni	1.35	Sr	ND
Au	_____	Gd	_____	O	_____	Ta	_____ % Nd = 57.71%
B	_____	Ge	_____	Os	_____	Tb	_____ ND = not detected with
Ba	3.14	Hf	_____	P	_____	Tc	_____ 0.2 ppm limit
Be	ND	Hg	_____	Pb	ND	Te	_____ Water = 0.583%
Bi	ND	Ho	_____	Pd	_____	Ti	ND
Br	_____	I	_____	Pm	_____	Tm	_____
C	_____	In	_____	Pr	_____	V	ND
Ca	23.2	Ir	_____	Pt	_____	W	_____
Cd	ND	K	< 5	Rb	_____	Y	_____
Ce	_____	La	_____	Re	_____	Yb	_____
Co	ND	Li	ND	Rh	_____	Zn	14.26
Cr	0.67	Lu	_____	Ru	_____	Zr	ND
Cs	_____	Mg	4.27	S	_____		
Cu	ND	Mn	0.28	Sb	ND		
Dy	_____	Mo	ND	Sc	_____		
Er	_____	N	_____	Se	ND		
Eu	_____	Na	7.88	Si	12.99		

QA Manager



Historical Overview

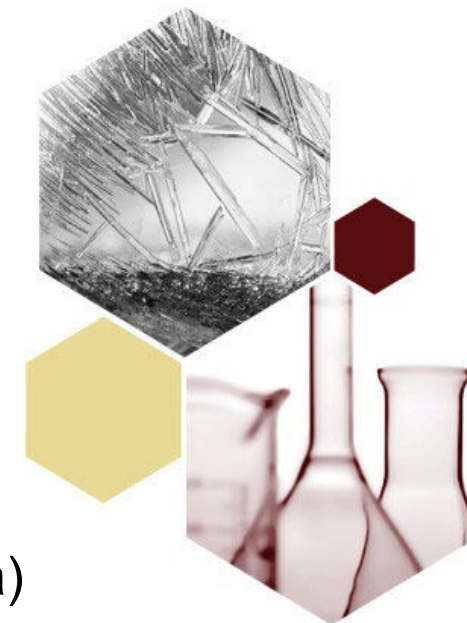
2012 - Present: High Purity *trans*-Stilbene for Crystal Growth

2014 Initiated sale of **Nova-Kem** to Wonik Materials (S.Korea)

2015 - 2020: Ferric Sulfate for Biomedical application ramped up to 10,000+kg/year by 2016

2016 Finalized sale of **Nova-Kem** to Wonik Materials

2020 - Present: Expanding portfolio and scale-up of Inorganics and metal-organics to supply “Precursors for Precursors”



Ferric Sulfate Hydrate

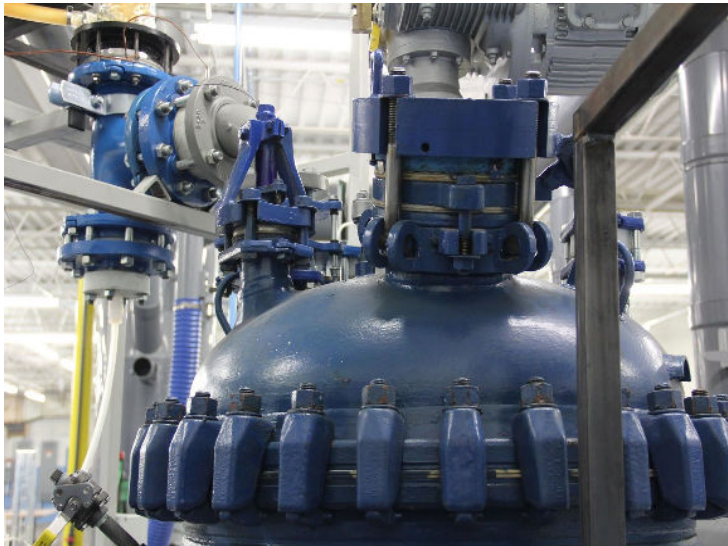
Applications

Biomedical; source of iron

Year One: 160 kg

Year Two: 9273 kg

Year Three: 18600 kg



CERTIFICATE OF ANALYSIS

PRODUCT: Ferric Sulfate hydrate

Lot#: 01207

Test	Specification	Analysis
Assay (as Fe ₂ (SO ₄) ₃)	73% min.	78.77%
Insoluble Material	0.02% Max	< 0.01%
<u>Chloride</u> (Cl)	0.002% max	< 0.002%
<u>Nitrate</u> (NO ₃)	0.01% Max	< 0.01%
<u>Copper</u> (Cu)	< 10 ppm	< 1 ppm
Ferrous Iron as (Fe ⁺⁺)	0.02% Max	< 0.02%
Substances not precipitated by NH ₄ OH	0.01% Max	< 0.01%
pH of test solution	> 4.5	Passes test
Zinc (Zn)	< 50 ppm	4.86 ppm
Lead (Pb)	< 1 ppm	< 1 ppm
Aluminum (Al)	< 20 ppm	4.92 ppm
Tin (Sn)	< 5 ppm	1.44 ppm
Thallium (Tl)	< 10 ppm	< 1 ppm
Arsenic (As)	< 1 ppm	< 1 ppm
Molybdenum (Mo)	< 10 ppm	< 1 ppm
Cadmium (Cd)	< 5 ppm	< 1 ppm
Mercury (Hg)	< 1 ppm	< 1 ppm
Bismuth (Bi)	< 2 ppm	< 1 ppm
Antimony (Sb)	< 2 ppm	< 1 ppm
Silver (Ag)	< 5 ppm	< 1 ppm

Production Capabilities

- Over 25,000 Square Feet of Manufacturing Space
- 50,100, 200, and 300 gallon Glass-lined Reactors
- Stainless steel reactors and blending tanks up to 800 gallons
- Hot-Oil Heating up to 230° C
- Drying Ovens
- Inert Atmosphere Furnace
- Milling and Grinding Equipment
- Inert-Gas Handling and Packaging
- Ultrapure DI Water System
- Warehousing Space



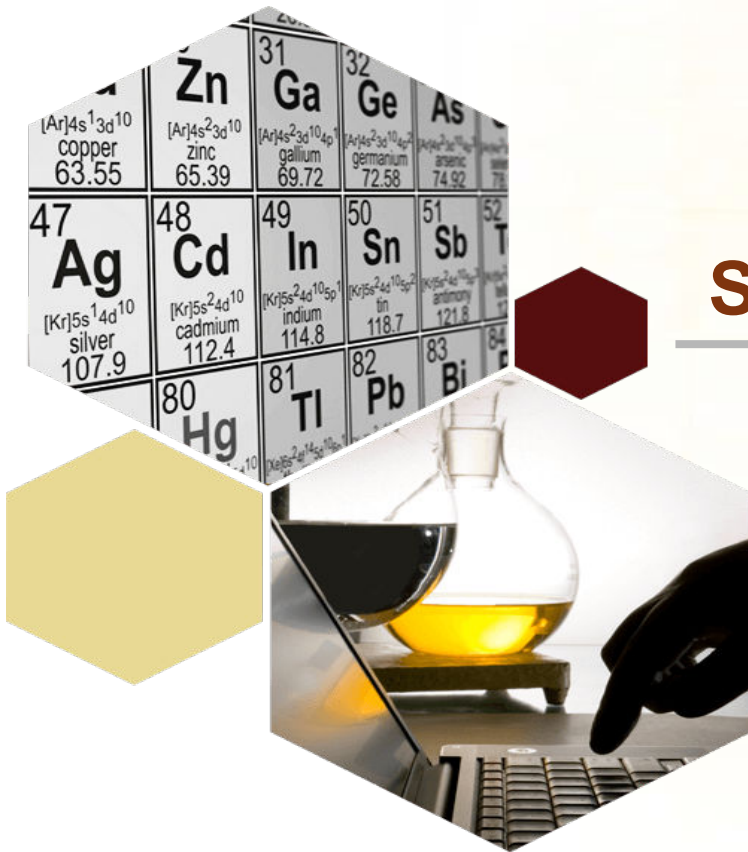
In House Analytical Capabilities

- ICP-OES – for trace metals analysis
- X-Ray Diffraction (XRD)
- FT-IR and UV-Vis
- Karl Fischer Titration (KF)
- Differential Scanning Calorimetry (DSC)
- Thermogravimetric Analysis (TGA)
- 60 MHz NMR
- Gas Chromatograph (GC)



Site Improvements

Building for the future...



2024 Facility Improvement



R & D Laboratory

FULL REMODEL

Electric, Make-Up Air/Exhaust,

Heating/AC, Plumbing,

Cabinetry, Chillers, Nitrogen

lines, Custom Walk in Hood and

Glovebox

Before



After



Before



After



2024 Completed ISO Certification



QMS

- Define Requirements
- Confirm Order
- Issue Job Orders
- Organize Labor & Materials

- Ordering
- Inspection
- Preservation
- Traceability

- Sustainability
- Maintenance
- Calibration
- Records

- Records
- Preservation of Data
- Document Control

**Verify
&
Process**

**Stock
&
Materials**

**Plan
&
Equipment**

**Records
&
Documentation**

**Customer
Requirement**

CONTINUOUS IMPROVEMENTS

**Customer
Satisfaction**

- Labor Force
- Training
- Health & Safety
- Communications

**Human
Resource
s**

**Environmental
Resource
s**

- Location
- Building
- Work Conditions
- Safety & Security

**Analysis
&
Monitorin
g**

- Customer Feedback
- Measurements
- Preventative Action
- Audits & Reviews

Catalog

- Over 1200 Products
- Customer-Friendly Search Engine
- 70% Manufactured in House
- Custom Packaging to Prevent Excess Inventory
- Technical Service Support
- Customization Options
- Fast Delivery & Competitive Pricing



Customers

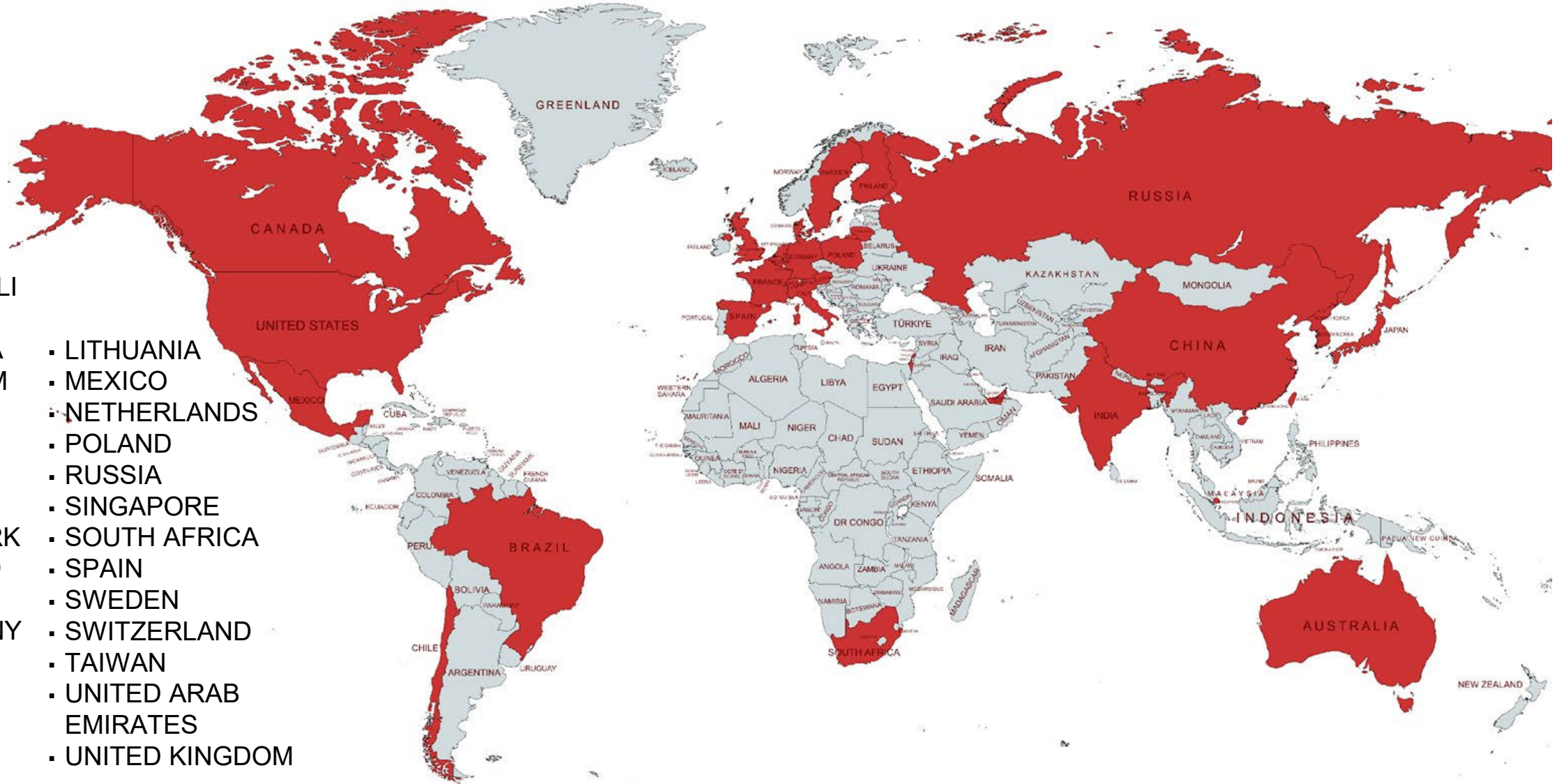
- Sigma-Aldrich
- Bayer
- Apollo Scientific
- Dow Corning
- Coherent Crystals
- Siemens Diagnostics
- Merck
- Inrad Optics
- PPG Industries
- ATMI
- Alfa Aesar
- Air Products



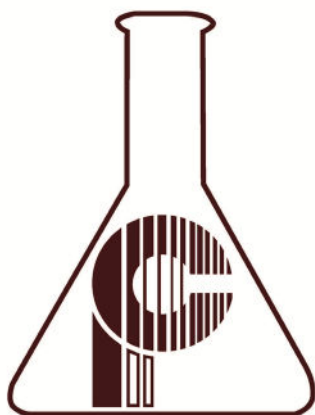
- Lawrence Livermore National Laboratory
- Sandia National Laboratories
- Oakridge National Laboratory
- Ames Laboratory
- Motorola
- IBM
- Micron Technologies
- 3M
- Shell Chemicals
- BASF
- Strem



We are International – 30 Countries Around the World



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- INDIA
- ISRAEL
- ITALY
- JAPAN
- KOREA
- LITHUANIA
- MEXICO
- NETHERLANDS
- POLAND
- RUSSIA
- SINGAPORE
- SOUTH AFRICA
- SPAIN
- SWEDEN
- SWITZERLAND
- TAIWAN
- UNITED ARAB EMIRATES
- UNITED KINGDOM



ProChem inc.

- **Come see us in Booth 406**

- **Contact us**

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Our Website: <https://prochemonline.com/>

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